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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,520	09/13/2001	Anthony John O'Dowd	GB920000078	2615

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EXAMINER	
ROCHE, TRENTON J	
ART UNIT	**PAPER NUMBER**
2193	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/682,520	O'DOWD, ANTHONY JOHN	
	Examiner	Art Unit	
	Trenton J. Roche	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action is responsive to communications filed 21 December 2006.

2. Claims 1-15 have been examined.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 13 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,173,395 to Wisor et al, hereafter referred to as Wisor.

Regarding claim 1:

Wisor teaches:

- a method for tracing the execution path of a computer program comprising at least one module including a plurality of instructions ("to enable the user to trace the sequence of execution of instructions..." in col. 3 lines 1-2)
- at least one of said instructions being a branch instruction ("The stored data identifies whether or not certain branches in the test program were taken..." in col. 4 lines 58-59)
- identifying each branch instruction ("involves detecting the branch instructions..." in col. 6 lines 16-17)

- evaluating each branch instruction to be one of true and false, and responsive to an evaluation of true, pushing at least one unique identifier into a predefined area of storage, wherein said at least one unique identifier uniquely corresponds to a set of instructions executed as a result of said evaluation of true ("When a test program is executed, a trace record is generated and stored in the BTHB (branch trace history buffer)...the bitmap entries are generated for a series of conditional branches and contain individual bits which represent the taken or not-taken status of the branches" in col. 3 lines 11-21. Further, "1's represent taken branches and 0's represent not-taken branches." in col. 7 lines 47-48. Note Figure 3 and the corresponding sections of the disclosure, of which depicts one exemplary bitmap generated as a result of tracing, and is representative of one BTHB entry. Each 1 and 0 is uniquely assigned a bit position in the bitmap entry in the order that the branch is encountered within the program and is furthermore uniquely associated to the specific taken/not-taken branch. The conditional of taken/not-taken represents a true/false conditional. Finally, the "1" is a unique identifier which uniquely corresponds to the set of instructions which are "taken" branches.)

substantially as claimed.

Regarding claim 13 and 14:

Claims 13 and 14 are directed a an apparatus and method for performing the method of claim 1, and are rejected for the reasons set forth in connection with claim 1.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:.

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,173,395 to Wisor et al, hereafter referred to as Wisor.

Regarding claim 2:

The rejection of claim 1 is incorporated, and further, Wisor discloses providing the predefined area of storage with memory (Note Figure 1, item 30). Wisor does not explicitly disclose the memory as being volatile memory. Official Notice is taken that at the time the invention was made, the use of volatile memory was well known to one of ordinary skill in the art. As such, one of ordinary skill in the art at the time the invention was made would choose to utilize volatile memory for the system disclosed by Wisor for the purposes of freeing memory space when the computer is powered down and no longer in use.

Regarding claim 3:

The rejection of claim 1 is incorporated, and further, Wisor discloses providing the predefined area of storage with memory (Note Figure 1, item 30). Wisor does not explicitly disclose the memory as being non-volatile memory. Official Notice is taken that at the time the invention was made, the use of non-volatile memory was well known to one of ordinary skill in the art. As such, one of ordinary

skill in the art at the time the invention was made would choose to utilize non-volatile memory for the system disclosed by Wisor for the purposes of retaining information in memory when the computer is powered down and no longer in use.

7. Claims 4-12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,173,395 to Wisor et al, hereafter referred to as Wisor in view of U.S. Patent 6,353,924 to Ayers et al, hereafter referred to as Ayers.

Regarding claim 4:

The rejection of claim 1 is incorporated, and further, Wisor discloses outputting the contents of the storage area at a predetermined point in time ("the contents of the BTHB and the test code are retrieved into the test station" in col. 3 lines 22-24). Wisor does not explicitly disclose outputting the contents to a file. Ayers discloses in an analogous trace recording system outputting trace sequence information to a file as claimed ("The sequence information can be recorded...to a disk file" in col. 3 lines 60-61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the file saving capabilities of Ayers with the trace recording system of Wisor, as this would enable a user to archive tracing records in the system disclosed by Wisor.

Regarding claim 5:

The rejection of claim 4 is incorporated, and further, Wisor discloses outputting the trace information upon exit from at least one module as claimed ("After a program is executed on the system under test, the contents of the BTHB are retrieved into the computer system" in col. 9 lines 11-12)

Regarding claim 6:

The rejection of claim 5 is incorporated, and further, Wisor discloses outputting the contents of the storage area at the same time as the exit trace information as claimed ("After a program is executed on the system under test, the contents of the BTHB are retrieved into the computer system" in col. 9 lines 11-12)

Regarding claim 7:

The rejection of claim 4 is incorporated, and further, Wisor discloses determining whether the storage area is full, and responsive to a positive determination, outputting the contents as claimed ("Tracing can be set to stop...when the BTHB is full" in col. 8 lines 34-35)

Regarding claim 8:

The rejection of claim 4 is incorporated, and further, Wisor does not explicitly disclose determining whether a failure has occurred within the program, and responsive to a positive determination, outputting the contents to a file. Ayers discloses in an analogous trace recording system determining whether a failure has occurred and outputting the contents to a file as claimed ("upon some triggering event such as a system crash, the post-processor writes out the sequence record..." in col. 9 lines 65-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the failure-responsive outputting capabilities of Ayers with the trace recording system of Wisor, as this would enable a user to obtain the exact sequence of instructions that executed prior to a crash in the system disclosed by Wisor as stated in col. 2 lines 21-27 of Ayers.

Regarding claim 9:

The rejection of claim 4 is incorporated, and further, Wisor discloses determining whether the predefined area of storage is full, and overwriting the first unique identifier in the storage area as claimed ("The buffer can be set to wrap around so that the oldest entries are overwritten by the newest entries..." in col. 8 lines 35-37)

Regarding claim 10:

The rejection of claim 9 is incorporated, and further, Wisor discloses writing the position of the most recent unique identifier to be written out to the storage area to the storage area as claimed ("When a conditional branch is found, a counter is incremented..." in col. 9 lines 57-58. The counter represents the position.)

Regarding claim 11:

The rejection of claim 10 is incorporated, and further, Wisor discloses using the position to determine number of unique identifiers that have been overwritten as claimed ("the BTHB contents are checked to determine whether the number of bits...matches the corresponding number of conditional branches in the instruction sequence" in col. 9 lines 18-21)

Regarding claim 12:

The rejection of claim 11 is incorporated, and further, Wisor does not explicitly disclose increasing the size of the predefined area of storage. Ayers discloses in an analogous trace recording system increasing the size of the predefined area of storage as claimed ("The buffer size limits the amount

of traceback history...Preferably this limit can be set dynamically..." in col. 6 lines 26-28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the size-increasing capabilities of Ayers with the trace recording system of Wisor, as this would enable a user to obtain a larger amount of traceback history in the system disclosed by Wisor.

Regarding claim 15:

Claim 15 recites a compiler for performing the method of claim 1, and is rejected for the reasons set forth in connection with claim 1. For the added limitation of a compiler, Wisor does not explicitly disclose a compiler. Ayers discloses in an analogous trace recording system a compiler for instrumenting a computer program as claimed (Note Figure 4, items 311 and 313 and the corresponding sections of the disclosure). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a compiler in the system of Wisor, as this would enable source code to be executed and subsequently traced.

Response to Arguments

8. Applicant's arguments filed 21 December 2006 have been fully considered but they are not persuasive.

Per claims 1, 13, 14 and 15:

Applicant states that Wisor does not teach or reasonably suggest the newly amended limitation of "responsive to an evaluation of true, pushing at least one unique identifier into a predefined area of storage, wherein said at least one unique identifier uniquely corresponds to a set of instructions executed as a result of said evaluation of true." Applicant further submits that Wisor

"in fact actively teaches away from it by disclosing a technique wherein an identifier consists solely of a zero or one bit which not only does not uniquely correspond to a set of executed instructions but is not even itself unique." The Examiner fails to see how this constitutes teaching away of the instant application, and further notes pages 6-8 of the Appeal Decision No. 2006-3352 of the Board of Patent Appeals and Inteferences, dated 30 November 2006, wherein the Board noted "[w]e consider the '1' bits in Wisor that indicate a branch was taken as unique . . . ." (Opinion, page 6). Accordingly, the Board has addressed this issue of whether the zero and one bits are unique, and the Examiner will not address these arguments further.

In light of the recent amendments, the Examiner must maintain the rejection of Wisor, as the amendments do not substantially change the scope of the claim in any substantial manner. The changing of "a unique identifier" to "at least one unique identifier" still only requires one unique identifier. As noted above, the Board finds that both the zero and one bits are unique identifiers. The changing of "said unique identifier is associated with the instructions executed" to "at least one unique identifier uniquely corresponds to a set of instructions executed" similarly does not obviate the prior interpretation of the claim scope. The Board notes that "[t]he unique identifier, '1,' in Wisor, only appears when the branch is evaluated as 'true' . . . ." (Opinion, page 6). Since the "1" bit only appears when branches are evaluated as "true," the unique "1" bit uniquely corresponds to the set of instructions which are "taken" instructions. Similarly, the "0" bit uniquely corresponds to the set of instructions which are "not-taken" instructions.

The Examiner further notes that the Board never stated that "the BPAI . . . appear[s] to concede that an amendment clarifying that a unique identifier uniquely corresponds to a set of instructions would differentiate the present invention from Wisor and thus traverse this rejection" as Applicant alleges. (Remarks, page 5). Rather, the Board noted that the specification of the instant

application supports a reading of "unique" such that "the identifier be unequivocally associated **with one and only one conditional branch instruction being found "true"** . . . ." (Opinion, page 8) (emphasis added), and concluded that interpreting the term "unique" in this way constituted reading too much of the specification into the claim language. This is clearly different than stating that a unique identifier uniquely corresponding to a set of instructions would differentiate the present invention from Wisor.

Accordingly, Wisor discloses the required limitations, and the rejections regarding claims 1 and 13-15 are proper and maintained.

Per claims 2-12:

Applicant states that claims 2-12 are allowable as being dependent on an allowable base claim. As was shown above, the rejections of independent claims 1, 13, 14 and 15 are proper and maintained, and as such, the argument that claims 2-12 are allowable as being dependent upon an allowable base claim is considered moot. Futhermore, Applicant fails to show that the reasons to combine and motivations concerning the rejections of claim 2-12 are improper. As such, the rejections of claim 2-12 are proper and maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trenton J. Roche whose telephone number is (571) 272-3733. The examiner can normally be reached on Monday - Friday, 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Trenton J Roche
Examiner
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TJR

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